# EE 5453 --- Advanced Data Structures and Algorithms (Fall 2016)
# Course Syllabus

**Instructor**:
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**Office**: AET 2.376
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**Class Meeting Time:** 1:00-2:15PM (Tuesdays and Thursdays)
**Class Location**: MH 2.02.20
**Office Hours**: 4:00 – 6:00PM (Tuesdays and Thursdays) or by appointment.
**Website**: All class materials will be handled electronically through Blackboard Learn.

**Course Description**:
Algorithm design and analyses; real-world problem solving using programming.

**Prerequisite**:
Graduate standing. Non-experience in algorithms is assumed. However, some programming experience in high-level programming languages would be helpful in understanding pseudo-code and completing the course project.

**Textbook (required)**:
Introduction to Algorithms, 3rd Edition. (By Thomas H. Cormen , Charles E. Leiserson, Ronald Rivest, and Clifford Stein).
https://mitpress.mit.edu/books/introduction-algorithms

**Course Topics** (tentative):

- Sorting
- Divide-and-conquer
- Algorithm complexity analyses
- Amortization
- Elementary data structures
- Trees
- Heaps
- Hashing
- String matching
- Graphs
- Greedy algorithms
- Dynamic programming
- NP-completeness

**Grading Policy**:

- Homework assignments: **30%**
  - 3 assignments of 10% each
- Exams: **40%**
  - Exam 1 (12.5%) + Exam 2 (12.5%) + Final (15%)
- Project: **25%**
- Quizzes: **5%**
  - The instructor will randomly choose a few classes to ask the students to turn in an answer to a very simple question. These are mainly for checking attendance.
- Total: **100%**

**About the Grading**

- The final letter grades will be curved based on student ranks and score gaps.
- After a grade (of an assignment/exam/quiz) is posted, you have up to a week to see me for any errors. After that, the grade is finalized.

**About the HW Assignments**

- Tentatively, the 3 assignments will be out in the 4th, 9th, and 15th week of the semester, and due in about one week.
- All must be turned in through Blackboard Learn (in pdf) before the specified deadlines. No late turn-ins.
- HW questions are good examples of exam questions.

**About the Exams**

- Tentatively, Exam 1 will be on Thursday 9/22 (class time); Exam 2 will be on Thursday 10/27 (class time); and Final Exam will be on Wednesday 12/14 (9:45am).
- All exams are open-books and open-notes. You can use your laptop for slides/HW/quizzes. However, Internet searching or communications with others are not allowed.
- No make-up exams (except for extremely special situations with legitimate proof and under discretion of the instructor).

**About the Project**:

- Tentatively, the project will be assigned after Exam 1 is completed (likely in the 6th week), and due in the last week of the semester.
- A real-world problem will be assigned. The student needs to propose a solution (i.e., designing an algorithm), implement it, and report the whole process.
- The project can be implemented in any high-level language (e.g., C, C++, Java, Python, etc.) under any operating system (e.g., Linux, Mac OS, Windows, etc.). However, it's the student's responsibility to make sure that the submitted program can be compiled and run on the instructor's machine with reasonable effort.
- **The project must be completed individually**. Discussions with others are allowed, but copying source code is NOT! Automatic source code checking tools, in addition to manual effort, will be applied to check for coding plagiarism. All parties involved (either copying or being copied) will lose all the points for the project. So, protect your source code!